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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Robert Palifka

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EXAMINER

NGHIEM, MICHAEL P

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/749,893	<b>Applicant(s)</b> PALIFKA ET AL.	
	<b>Examiner</b> MICHAEL P. NGHIEM	<b>Art Unit</b> 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Disposition of Claims: Claims pending in the application are 29,32,33,35,36,38,39,41-43,45,48,50-52,54-58,60,61,63-65,85-87,92-99,110-113 and 115-128.

Continuation of Disposition of Claims: Claims rejected are 29,32,33,35,36,38,39,41-43,45,48,50-52,54-58,60,61,63-65,85-87,92-99,110-113 and 115-128.

## **DETAILED ACTION**

The Amendment filed on May 20, 2008 has been acknowledged.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the thermoplastic bonding component is placed downstream of the ink channel and the piezoelectric is positioned to subject ink within the ink channel to jetting pressure (claims 122, 125, 127), the thermoplastic bonding component is placed between the ink channel and the orifice plate and the piezoelectric is positioned to subject ink within the ink channel to jetting pressure (claims 123, 126, 128) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

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consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 122, 123, and 125-128 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 122, 125, and 127, the first bonding component is placed downstream of the ink channel is unclear. Is the ink channel upstream of the first bonding component?

Claims 123, 126, and 128, the first bonding component is placed between the ink channel and the orifice plate is unclear. Is the ink channel shown in Fig. 4? Does the ink channel run through the first bonding component and the orifice plate?

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The remaining claims are also rejected under 35 U.S.C. 112, second paragraph, for being dependent upon a rejected base claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29, 33, 35, 36, 38, 39, 45, 48, 50, 52, 54-58, 60, 61, 85-87, 92-96, and 110-113, 115-117, and 119-128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. (US 6,755,511) in view of Baker (US 6,084,618).

Regarding claims 29, 45, and 52, Moynihan et al. discloses an apparatus (ink jet head, Fig. 1) and method (Fig. 1) comprising a piezoelectric element (34, 34') and a first bonding component heat-bonded to a surface the apparatus (column 3, lines 2-3);

wherein the apparatus further comprises an ink channel (33, 33'), the piezoelectric element being positioned to subject ink within the channel to jetting pressure (column 2, lines 31-33), and

electrical contacts arranged for activation of the piezoelectric element (column 2, lines 44-49).

Regarding claims 33, 93, and 120, Moynihan et al. discloses the first bonding component has a thickness between 10 microns and 125 microns (15 microns, column 5, lines 64-67).

Regarding claims 38, 60, and 96, Moynihan et al. discloses a series of channels (Fig. 3).

Regarding claims 39 and 61, Moynihan et al. discloses each of said channels is covered by a single piezoelectric element (34, 34', Fig. 2).

Regarding claim 45, Moynihan et al. further discloses contacting a first component (10) of an ink jet printing module having a surface (Fig. 1) (column 2, lines 28-32).

Regarding claims 52, 110, and 115, Moynihan et al. further discloses a second bonding component (Figs. 1, 2).

Regarding claims 55, 111, and 116, Moynihan et al. discloses the second bonding component includes a first surface heat-bonded to the surface of the piezoelectric element and a second surface heat-bonded to a surface of an ink jet printing module component (column 3, lines 2-3; Fig. 1).

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Regarding claims 56, 112, and 119, Moynihan et al. discloses the second bonding component includes an electrode pattern (electrodes on bonding material, column 2, lines 58-63; column 3, lines 4-8).

Regarding claim 87, Moynihan et al. discloses the surface and the first bonding component are substantially free of liquid adhesive (when they are bonded and cooled).

Regarding claims 92 and 113, Moynihan et al. discloses the first bonding component has a thickness between 1 micron and 150 microns (15 microns, column 5, lines 64-67).

Regarding claim 117, Moynihan et al. discloses the second component of the ink jet printing module is a piezoelectric element (34, 34', Fig. 1).

Regarding claim 121, Moynihan et al. discloses the second bonding component (30's) has dimensions corresponding to the surface (Fig. 1).

Regarding claims 122, 125, and 127, Moynihan et al. discloses the first bonding component is placed downstream of the ink channel (Fig. 1; column 2, lines 32-34).

Regarding claims 123, 126, and 128, Moynihan et al. discloses the first bonding component is placed between the ink channel and the orifice plate (14) (Fig. 1; column 2, lines 32-34).



However, Moynihan et al. does not disclose:

- regarding claim 29, 45, and 52, the first thermoplastic bonding component covering the ink channel and is patterned to include a filter.
- regarding claims 35, 54, and 94, the first thermoplastic bonding component has a thickness between 20 microns and 50 microns.
- regarding claims 36, 58, and 95, the first thermoplastic bonding component includes an adhesive polyimide.
- regarding claims 48, the first thermoplastic bonding component includes a plurality of openings.
- regarding claim 50, the filter includes a repeating pattern of units having a plurality of openings.
- regarding claims 52, 110, and 115, a second thermoplastic bonding component heat-bonded to the surface.
- regarding claim 85, applying pressure to the surface and the first thermoplastic bonding component.
- regarding claim 86, pressure is applied during heating.
- regarding claim 121, the second thermoplastic bonding component.
- regarding claim 124, patterning the first thermoplastic component using a laser.

Nevertheless, Baker discloses the first thermoplastic bonding component (column 3, lines 34-37) covers the ink channel (Figs. 1, 2) and is patterned to include a filter (32)

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(Figs. 3), the first thermoplastic bonding component includes an adhesive polyimide (column 3, line 36), the first thermoplastic bonding component includes a plurality of openings (34), the filter includes a repeating pattern of units having a plurality of openings (30, 32, Fig. 2) for the purpose of preventing particles from flowing downstream to the nozzles (Fig. 3). Furthermore, Baker discloses the polymer sheet (30) can be used for bonding (column 3, lines 34-37). In light of the first bonding component disclosed by baker, it would be obvious to provide the second bonding component as a thermoplastic bonding component.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. with the thermoplastic filter and thermoplastic bonding materials as disclosed by Baker for the purposes of preventing particles from flowing downstream to the nozzles and bonding.

Even though Moynihan et al. as modified by Baker does not disclose applying pressure to the surface and the first thermoplastic bonding component during heating, it is common knowledge to apply pressure to the bonding elements for the purpose of holding the elements in place and heating the thermoplastic material for the purpose of melting it into a bonding liquid.

Even though Moynihan et al. as modified by Baker does not disclose the first thermoplastic bonding component has a thickness between 20 microns and 50 microns,

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it has been held that discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this particular instance, discovering the optimum or workable thickness would result in an optimum and workable thermoplastic filter (32).

Regarding claim 124, even though Moynihan et al. as modified by Baker et al. does not disclose patterning the first thermoplastic component using a laser, it has been held that determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Baker et al. discloses a patterned thermoplastic component (30, 32, Fig. 2).

Claims 32, 57, 118 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 52 above, and further in view of DeYoung et al. (US 4,751,774).

Regarding claims 32 and 57, Moynihan et al. **as modified** by Baker discloses all the claimed limitations as discussed above except the piezoelectric element comprising lead zirconium titanate.

Nevertheless, DeYoung et al. discloses that piezoelectric element comprising lead zirconium titanate (column 5, lines 9-12). DeYoung discloses that lead zirconium

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titanate is a well-known piezoelectric in the art (column 5, lines 9-11).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with lead zirconium titanate as disclosed by DeYoung et al. for the purpose of improving the availability of the piezoelectric material.

Claims 41, 42, 51, 63, and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29, 45, 50, and 52 above, and further in view of Admitted Prior Art of Fig. 5 (APA).

Regarding claims 41, 51, and 63, Baker further discloses the filter (30) including a repeating pattern of units (32's) having a plurality of openings (34) and a land between each pair of adjacent t units (Fig. 2).

However, Moynihan et al. **as modified** by Baker does not disclose:

- regarding claims 41, 51, and 63, the land between each pair of adjacent units is at least 50 microns.
- regarding claims 42 and 64, the filter has a width of 300 to 495 microns.

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Nevertheless, APA discloses a filter (Fig. 5) has a width of 300 to 495 microns (specification, page 7, line 13).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with a filter width as disclosed by APA for the purpose of obtaining an optimum and workable filter.

Even though Moynihan et al. as modified by Baker and APA does not explicitly disclose the land between each pair of adjacent units is at least 50 microns, APA discloses that the center-to-center spacing of the filter holes is 45 microns (specification, page 7, lines 11-12). It has been held that discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. In this particular instance, discovering the optimum or workable spacing would result in an optimum and workable thermoplastic filter (32).

Claims 43 and 97-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moynihan et al. in view of Baker as applied to claims 29 and 45 above, and further in view of Kishima (US 6,109,737).

Regarding claims 43 and 97, Moynihan et al. discloses an orifice plate (14).

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However, regarding claims 43, 98, and 99, Moynihan et al. does not disclose a protector strip adhered to the orifice plate, wherein either the orifice plate or the protector strip includes a thermoplastic bonding material.

Nevertheless, Kishima disclose a protector strip (251) adhered to the orifice plate (30) for the purpose of protecting the nozzle from ink adhering around the nozzle (column 35, lines 55-60), wherein either the orifice plate or the protector strip includes a thermoplastic bonding material (column 38, lines 50-55; Figs. 25, 74).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide Moynihan et al. as modified with a protector strip adhered to the orifice plate as disclosed by Kishima for the purpose of protecting the nozzle from ink adhering around the nozzle.

### ***Response to Arguments***

Applicant's arguments filed May 20, 2008 have been fully considered but they are not persuasive.

With respect to the 35 USC 103 rejections Applicants argue that neither Moynihan nor Baker teaches a thermoplastic bonding component that is "patterned to include a filter" and is "heat-bonded to a surface" of an apparatus.

Examiner's position is that Moynihan et al. discloses a first bonding component heat-bonded to a surface the apparatus (column 3, lines 2-3), while Baker discloses the first thermoplastic bonding component (column 3, lines 34-37) covers the ink channel (Figs. 1, 2) and is patterned to include a filter (32) (Figs. 3).

Applicants further argue that Baker's polymer sheet and adhesive coating functions separately and independently, the polymer sheet as a filter and the adhesive coating to bond the filter to the wafer. Baker's polymer sheet that includes the filter does not bond to his wafer.

Examiner's position is that the combination of polymer sheet having coatings on both sides (column 3, lines 34-37) in Baker teaches the "thermoplastic bonding material being patterned to include a filter". Baker teaches "bonded to the wafer 24 is a filter sheet or plate 30 having a plurality of filter areas 32 of which only several filter areas are depicted by solid rectangles" (column 3, lines 30-32). Baker further teaches "in one form, filter sheet 30 is a polymer sheet having a coating of adhesive on one side and, preferably a sheet of polyimide having a phenolic coating as a bonding adhesive on one side that will contact wafer 24" (column 3, lines 34-37). Thus, Baker clearly teaches a filter (30) that bonds to wafer (24).

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Applicants further argue that Baker does not disclose that his phenolic coating is a thermoplastic bonding material and can be heated to bond his filter to the wafer.

Examiner's position is that Baker discloses a filter being a polyimide sheet as a bonding adhesive (column 3, lines 34-37). It is well known in the art that polyimides are thermoplastics that can be heat-bonded to a surface of a substrate as disclosed by Yamanaka (US 6,432,348, column 6, lines 35-39). Thus, Baker teaches a thermoplastic bonding material (polyimide sheet) and can be heated to bond his filter (30) to the wafer (32) (column 3, lines 34-37).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Nghiem whose telephone number is (571) 272-2277. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Michael P. Nghiem/

Primary Examiner, GAU 2863

August 18, 2008